CLAIMS

1. A method of continuously coating at least one substrate with a buffer layer as a support for a ceramic superconducting material comprising loading the substrates onto individual feed spools, feeding the at least one substrate through an vacuum deposition chamber wherein a coating is applied to the at least one substrate while the substrate is being bombarded by ion beams from dual RF- ion sources and reloading the coated substrates onto individual take-up spools.

2. The method of claim 1 where the feed and take up spools are located external to the deposition chamber.

3. The method of claim 1 where the substrates are inter-spooled with kapton polymer protective tapes.

4. The method of claim 1 where the energy source is a DC electron beam.

5. The method of claim 1 where from about 2 to about 12 substrates are simultaneously being coated.

6. The method of claim 1 where at least two substrates are simultaneously being coated.

7. A method of continuously coating at least one substrate with a buffer layer as a support for a ceramic superconducting material comprising

providing at least one substrate feed spool of substrate,

unspooling and threading the at least one substrate through a vacuum deposition chamber,

loading coating material that is to be deposited onto a surface of the at least one substrate into the vacuum deposition chamber,

reducing the pressure in the deposition chamber to no greater than about 10^{-5} Torr,

injecting oxygen into the deposition chamber,

initializing dual RF-ion sources located in the deposition chamber to a pre-determined power level and trajectory where the resulting ion beams are directed toward substrate tapes translating through a deposition zone in the deposition chamber,

eroding the coating material by bombarding the coating material with electrons or ions produced by an energy source selected from the group consisting of DC electron beam, magnetron and ion beam energy sources,

feeding the substrates through a deposition zone in the vacuum chamber,

allowing the coating material eroded from the coating source to impinge upon a surface of the substrates for a period of time sufficient to deposit a coating of evaporated coating material onto the tape, and

collecting the at least one coated substrate on individual take-up spools.

8. The method of claim 7 wherein RF ion sources are arranged on opposite sides of the coating source in a manner such that the resulting ion beams are directed toward the substrate tapes at incident angles of approximately 55 degrees.

9. A method of continuously coating at least one substrate with a buffer layer as a support for a ceramic superconducting material comprising loading the substrates onto individual feed spools, feeding the at least one substrate through an vacuum deposition chamber wherein a coating is applied to the at least one substrate in a deposition zone while being bombarded by dual RF-ion sources which impinge on the substrate at an incident angle of about 55 degrees and reloading the coated substrates onto individual take-up spools.